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# TPESD05R4C6
## 4-line Ultra Low Capacitance TVS Diode Array

www.sot23.com.tw

## Features

- ESD Protect for 4 high-speed I/O channels
- Provide ESD protection for each channel to
  **IEC 61000-4-2 (ESD) ±18kV (air), ±14kV (contact)**
  **IEC 61000-4-4 (EFT) (5/50ns) Level-3, 20A for I/O, 80A for Power**
  **IEC 61000-4-5 (Lightning) 6.5A (8/20μs)**
- For below 5V operating voltage
- Low capacitance : 1.3pF typical
- Fast turn-on and Low clamping voltage
- Array of surge rated diodes with internal equivalent TVS diode
- Small package saves board space
- Solid-state silicon-avalanche and active circuit triggering technology
- Green part available

## Mechanical Characteristics

- Package:SOT363
- Lead Finish :Matte Tin
- UL Flammability Classification Rating 94V-0

RoHS

## Applications

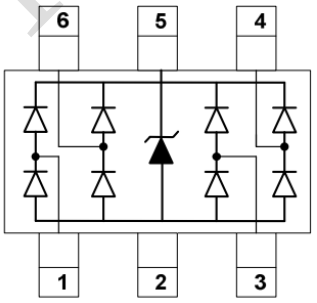
- USB2.0 Power and Data lines protection
- Notebook and PC Computers
- Monitors and Flat Panel Displays
- IEEE 1394 Firewire Ports
- Video Graphics Cards
- SIM ports

## Ordering Information

| Part Number | Qty per Reel | Reel Size |
|---|---|---|
| TPESD05R4C6 | 3000 | 7″ |



## Dimensions and Pin Configuration




Pin Configuration

## Absolute Maximum Ratings (Tamb=25°C unless otherwise specified)

| PARAMETER | PARAMETER | RATING | UNITS |
|---|---|---|---|
| Peak Pulse Current (tp =8/20μs) | $I_{PP}$ | 6.5 | **A** |
| Operating Supply Voltage (VDD-GND) | $V_{DC}$ | 6 | **V** |
| ESD per IEC 61000-4-2 (Air)<br>ESD per IEC 61000-4-2 (Contact) | $V_{ESD}$ | 18<br>14 | **kV** |
| ESD per IEC 61000-4-2(Air)(VDD-GND)<br>ESD per IEC 61000-4-2(Contact) (VDD-GND) | $V_{ESD\_VDD}$ | 30<br>30 | **kV** |
| Lead Soldering Temperature | $T_{SOL}$ | 260 (10 sec.) | **°C** |
| Operating Temperature | $T_{OP}$ | -55 to +85 | **°C** |
| Storage Temperature | $T_{STO}$ | -55 to +150 | **°C** |
| DC Voltage at any I/O pin | $V_{IO}$ | (GND – 0.5) to (VDD + 0.5) | **V** |

## Electrical Characteristics (TA=25°C unless otherwise specified)

| PARAMETER | SYMBOL | CONDITIONS | MIN | TYP | MAX | UNITS |
|---|---|---|---|---|---|---|
| Reverse Stand-Off Voltage | $V_{RWM}$ | Pin 5 to pin 2, T=25 °C | | | 5 | **V** |
| Reverse Leakage Current | $I_{Leak}$ | $V_{RWM}$ = 5V, T=25 °C, Pin 5 to pin 2 | | | 5 | **μA** |
| Channel Leakage Current | $I_{CH\_Leak}$ | $V_{Pin\ 5}$ = 5V, $V_{Pin\ 2}$ = 0V, T=25 °C, $V_{CH}$ = 0 ~ 5V | | | 1 | **μA** |
| Reverse Breakdown Voltage | $V_{BV}$ | $I_{BV}$ = 1mA, T=25 °C<br>Pin 5 to Pin 2 | 6 | | 9 | **V** |
| Forward Voltage | $V_F$ | $I_F$ = 15mA, T=25 °C<br>Pin 2 to Pin 5 | | 0.8 | 1 | **V** |
| Clamping Voltage | $V_{CL}$ | $I_{PP}$=5A, tp=8/20μs, T=25 °C<br>Any Channel pin to Ground | | 8.1 | 9 | **V** |
| ESD Clamping Voltage –I/O | $V_{clamp\_io}$ | IEC 61000-4-2 +6kV, T=25 °C, Contact mode, Any Channel pin to Ground | | 12.5 | | **V** |
| ESD Clamping Voltage –VDD | $V_{clamp\_VDD}$ | IEC 61000-4-2 +6kV, T=25 °C, Contact mode, VDD pin to Ground | | 9 | | **V** |
| ESD Dynamic Turn-on Resistance –I/O | $R_{dynamic\_io}$ | IEC 61000-4-2 0~+6kV, T=25 °C, Contact mode, Any Channel pin to Ground | | 0.35 | | **Ω** |
| ESD Dynamic Turn-on Resistance –VDD | $R_{dynamic\_VDD}$ | IEC 61000-4-2 0~+6kV, T=25 °C, Contact mode, VDD pin to Ground | | 0.2 | | **Ω** |
| Channel Input Capacitance | $C_{IN}$ | $V_{pin5}$ = 5V, $V_{pin2}$ = 0V, **$V_{IN}$ = 2.5V**, f = 1MHz, T=25 °C, Any Channel pin to Ground | | 1.3 | 1.6 | **pF** |
| Channel to Channel Input Capacitance | $C_{CROSS}$ | $V_{pin5}$ = 5V, $V_{pin2}$ = 0V, **$V_{IN}$ = 2.5V**, f = 1MHz, T=25 °C , Between Channel pins | | 0.12 | 0.14 | **pF** |
| Variation of Channel Input Capacitance | $\triangle C_{IN}$ | $V_{pin5}$ = 5V, $V_{pin2}$ = 0V, **$V_{IN}$ = 2.5V**, f = 1MHz, T=25 °C , Channel_x pin to Ground - Channel_y pin to Ground | | 0.05 | 0.07 | **pF** |

# TPESD05R4C6
## 4-line Ultra Low Capacitance TVS Diode Array



**PROTECTION PRODUCTS**
**Typical charateristics**

**Fig1. 8/20μs Pulse Waveform**

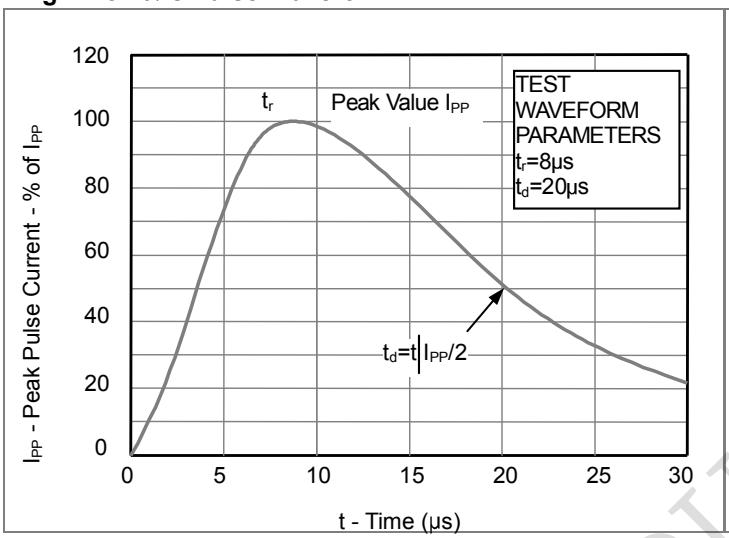



**Fig2. ESD Pulse Waveform (according to IEC 61000-4-2)**

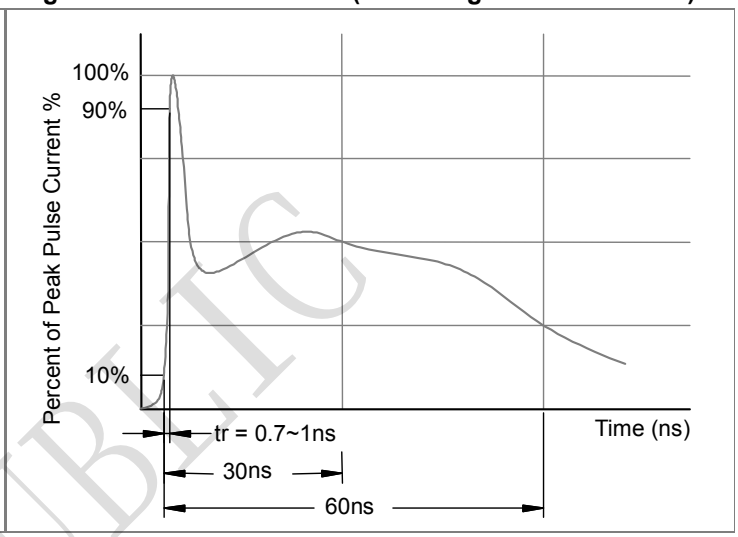
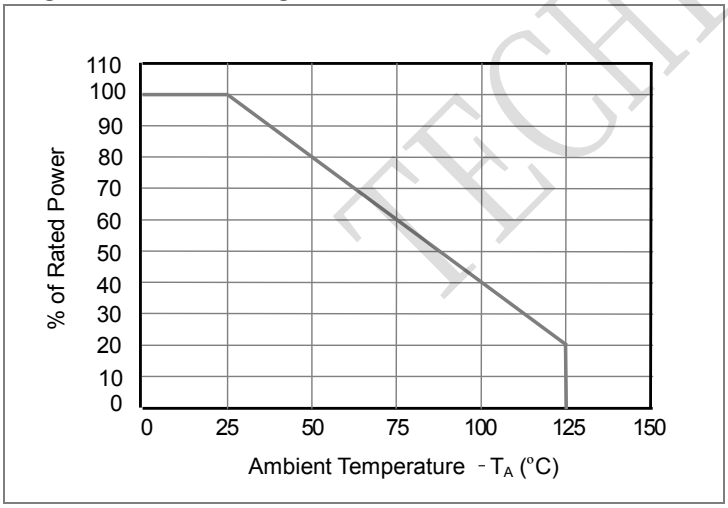


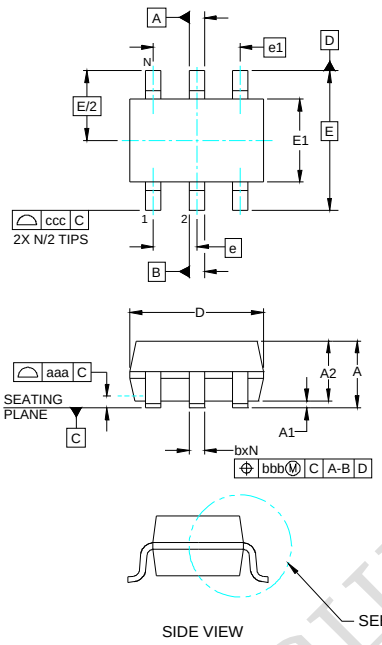

**Fig3. Power Derating Curve**



# TPESD05R4C6
## 4-line Ultra Low Capacitance TVS Diode Array

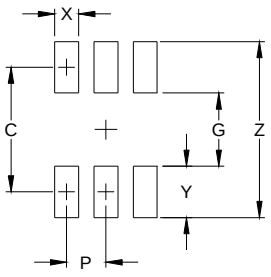


## Outline Drawing - SOT363




| DIM | INCHES | | | MILLIMETERS | | |
|---|---|---|---|---|---|---|
| | MIN | NOM | MAX | MIN | NOM | MAX |
| A | - | - | .043 | - | - | 1.10 |
| A1 | .000 | - | .004 | 0.00 | - | 0.10 |
| A2 | .028 | .035 | .039 | 0.70 | 0.90 | 1.00 |
| b | .006 | - | .012 | 0.15 | - | 0.30 |
| c | .003 | - | .009 | 0.08 | - | 0.22 |
| D | .071 | .079 | .087 | 1.80 | 2.00 | 2.20 |
| E1 | .045 | .049 | .053 | 1.15 | 1.25 | 1.35 |
| E | .083 BSC | | | 2.10 BSC | | |
| e | .026 BSC | | | 0.65 BSC | | |
| e1 | .051 | | | 1.30 BSC | | |
| L | .010 | .014 | .018 | 0.26 | 0.36 | 0.46 |
| L1 | (.017) | | | (0.42) | | |
| N | 6 | | | 6 | | |
| θ1 | 0° | - | 8° | 0° | - | 8° |
| aaa | .004 | | | 0.10 | | |
| bbb | .004 | | | 0.10 | | |
| ccc | .012 | | | 0.30 | | |

## Land Pattern -SOT363




| DIM | INCHES | MILLIMETERS |
|---|---|---|
| C | (.073) | (1.85) |
| G | .039 | 1.00 |
| P | .026 | 0.65 |
| X | .016 | 0.40 |
| Y | .033 | 0.85 |
| Z | .106 | 2.70 |

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